

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2003-286687

(43)Date of publication of application : 10.10.2003

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(51)Int.Cl. D21H 19/42  
D21H 19/38  
D21H 19/40

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(21)Application number : 2002-090613 (71)Applicant : MITSUBISHI PAPER MILLS LTD

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## (54) MAT COATED PAPER

### (57)Abstract:

PROBLEM TO BE SOLVED: To provide mat coated paper suppressed in blank brightness and excellent in quality of a blank surface, quality of a printed surface and printed brightness.

SOLUTION: The mat coated paper is applied with a coating layer comprising a pigment and an adhesive as main ingredients on one surface or both surfaces of base paper made of pulp as a main raw material. The pigment comprises kaolin, dry milling calcium carbonate and a hollow synthetic resin pigment and contains 2-10 mass% hollow synthetic resin pigment based on the total pigments. The coating layer comprises an undercoat layer and a finish coat layer. The undercoat layer comprises wet heavy calcium carbonate and the adhesive and the finish coat layer comprises the pigment and the adhesive as main ingredients. The pigment comprises dry milling calcium carbonate and the hollow synthetic resin pigment and contains 2-10 mass% hollow synthetic resin pigment based on the total pigments.

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## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's  
decision of rejection]

[Date of requesting appeal against examiner's  
decision of rejection]

[Date of extinction of right]

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**CLAIMS**

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**[Claim(s)]**

[Claim 1] Lusterless coated paper characterized by this pigment consisting of a kaolin, a dry grinding calcium carbonate, and a hollow synthetic-resin pigment, and coming to carry out 2-10 mass % content of this hollow synthetic-resin pigment into [ all ] a pigment in the lusterless coated paper which prepared the coating layer which consists of a pigment and adhesives as a principal component in one side or both sides of stencil paper which use pulp as the main raw material.

[Claim 2] In the lusterless coated paper which prepared the two-layer coating layer which consists of a pigment and adhesives as a principal component in one side or both sides of stencil paper which use pulp as the main raw material It is the coating layer which an under coat coating layer turns into from wet whiting and adhesives. Lusterless coated paper characterized by a finishing coating layer using a pigment and adhesives as a principal component, and this pigment consisting of a kaolin, a dry grinding calcium carbonate, and a hollow synthetic-resin pigment, and coming to carry out 2-10 mass % content of this hollow synthetic-resin pigment into [ all ] a pigment.

[Claim 3] Lusterless coated paper according to claim 1 or 2 with which a dry grinding calcium carbonate is characterized by occupying more than 40 mass % in all the pigments of the coating layer nearest to a paper front face.

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[Translation done.]

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

#### [0001]

[Field of the Invention] This invention relates to lusterless coated paper. It is related with lusterless coated paper excellent in a blank paper surface condition, a printing surface condition, and printing gloss in more detail.

#### [0002]

[Description of the Prior Art] Blank paper gloss is coated paper pressed down low, in connection with the visualization of printed matter, with gross coated paper with high blank paper gloss, the goodness of the readability of an alphabetic printing part and the repeatability of an image printing part which is hard to read is accepted, and lusterless coated paper is used widely in recent years.

[0003] Since lusterless coated paper must suppress blank paper gloss low, many examples which use many calcium carbonates, especially coarse calcium carbonates with large mean particle diameter for the pigment of a coating layer are seen.

[0004] Moreover, the facility of the software calender which the technique of suppressing blank paper gloss is also used by mitigating calender processing of finishing after coating, therefore can add light calender processing with a small number of number of nips from the usual supercalender etc. is also used.

[0005] However, if a calcium carbonate, especially the calcium carbonate of coarse grain are used for the pigment of a coating layer so much, the problem to which the printing gloss which whose ink becomes easy to be depressed in a coated layer, and has big influence on the printing effectiveness especially at the time of offset printing falls will occur at the time of printing. It is also the same as when mitigating calender processing, and the fall of printing gloss is not avoided.

[0006] When printing gloss falls in lusterless coated paper printed matter, image repeatability falls. Blank paper gloss's being low and the semantics which prepared the coating layer conjointly will be lost. For this reason, the device which raises the printing gloss of lusterless coated paper has so far been performed variously.

[0007] It is known that high printing gloss can be acquired suppressing blank paper gloss low as a pigment of a coating layer using the pigment which made the calcium carbonate the subject by carrying out little combination of the satin white into this pigment. When a satin white becomes the amount which exceeds 10 mass % in a coating layer, blank paper gloss is too high, but if it has blended seven to 10% of the weight among [ all ] the pigment, desirable low blank paper gloss level and high printing gloss can be acquired.

[0008] However, by pH 9-10 of the satin white non-blended coating liquid used as the strong-base nature of pH 12-13, the difference of pH has a bad influence on the compatibility of coating liquid greatly, condensation occurs in coating liquid and the coating liquid which did 7-10 mass % content of a satin white into [ all ] the pigment serves as a coating operable fall. Moreover, particle diameter of a satin white is small, that it is high pH also has conjointly the fault to which surface reinforcement falls, and if the strong ink of a tuck is used by offset printing, the problem of an edge pick etc. will be caused.

[0009] moreover, use (for example, JP,4-18077,B) of the whiting which has specific particle size distribution, use (for example, JP,1-22400,B) of the cube form calcium carbonate which performs wet-grinding processing and has a specific grain size, and \*\* -- although there is also a technique which controls the configuration of a calcium carbonate and particle diameter like, it does not result in the level satisfied in respect of printing gloss.

[0010] Moreover, although there is an approach using a surface roughening roll etc. (for example, JP,58-73794,A, JP,58-146715,A, JP,59-53956,A) and blank paper gloss low to be sure and high printing gloss can be realized, in order to carry out mold attachment with a split-face roll, the example in which the repeatability of the halftone dot at the time of printing is inferior tends to happen from the approach of finishing to a coated paper front face. Moreover, since the consistency of coated paper becomes high, it also becomes a big fault that the loft which is one of the merits of lusterless coated paper will be lost.

[0011]

[Problem(s) to be Solved by the Invention] In manufacturing the lusterless coated paper which prepared the coating layer which consists of a pigment and adhesives as a principal component in one side or both sides of stencil paper which use pulp as the main raw material, this coating layer pigment consists of a kaolin, a dry grinding calcium carbonate, and a hollow synthetic-resin pigment, blank paper gloss is suppressed low, and the purpose of this invention offers lusterless coated paper excellent in a blank paper surface condition, a printing surface condition, and printing gloss.

[0012]

[Means for Solving the Problem] Blank paper gloss is suppressed low and this invention person came to complete lusterless coated paper excellent in a blank paper surface condition, a printing surface condition, and printing gloss, as a result of inquiring wholeheartedly that the above-mentioned trouble should be solved.

[0013] That is, in the lusterless coated paper which prepared the coating layer which consists of a pigment and adhesives as a principal component in one side or both sides of stencil paper to which the lusterless coated paper of this invention uses pulp as the main raw material, this pigment consists of a kaolin, a dry grinding calcium carbonate, and a hollow synthetic-resin pigment in the first place, and it is characterized by coming to contain this hollow synthetic-resin pigment in [ all ] a pigment two to 10% of the weight.

[0014] In the lusterless coated paper which prepared [ second ] the two-layer coating layer which consists of a pigment and adhesives as a principal component in one side or both sides of stencil paper to which the lusterless coated paper of this invention uses pulp as the main raw material It is the coating layer which an under coat coating layer turns into from a wet-grinding calcium carbonate and adhesives. A finishing coating layer uses a pigment and adhesives as a principal component, and this pigment consists of a kaolin, a dry grinding calcium carbonate, and a hollow synthetic-resin pigment, and it is characterized by coming to contain this hollow synthetic-resin pigment in [ all ] a pigment two to 10% of the weight.

[0015] In the above-mentioned invention, a dry grinding calcium carbonate is characterized by occupying more than 40 mass % in all the pigments of the coating layer nearest to a paper front face.

[0016]

[Embodiment of the Invention] Hereafter, the lusterless coated paper of this invention is explained to a detail. [0017] Since there is an inclination which shows blank paper gloss with the lowest dry grinding calcium carbonate among various pigments with the same particle diameter, the dry grinding calcium carbonate is used for the main pigment in this invention. In a wet-grinding calcium carbonate or precipitated calcium carbonate (precipitated calcium carbonate), the effectiveness of lowering blank paper gloss is inferior. However, as for a dry grinding calcium carbonate, oleophilic is high, in the coating layer which makes this a subject, the vehicle which makes a subject the resinous principle contained in ink is easy to be absorbed, and printing gloss tends to fall.

[0018] For this reason, in this invention, the hollow synthetic-resin pigment of a minute amount was blended, and it succeeded in stopping the vehicle rate of absorption in ink. Compared with the synthetic-resin pigment of the usual solid, since particle diameter is large, a hollow synthetic-resin pigment is

effective in decreasing the fine opening which makes ink vehicle rate of absorption quick.

[0019] The rate of a compounding ratio in all the pigments of a hollow synthetic-resin pigment needs to be two to 10 mass %, and when it is under 2 mass %, it is produced in the fall of printing gloss, and deterioration of a printing surface condition. When the rate of a compounding ratio exceeds 10 mass %, blank paper gloss goes up and the description as lusterless coated paper is lost.

[0020] Moreover, in preparing a coating layer, by preparing an under coat using the pigment which makes a wet-grinding calcium carbonate a subject, even after carrying out coating of the maximum surface which consists of a kaolin, a dry grinding calcium carbonate, and a hollow synthetic-resin pigment, and comes to contain this hollow synthetic-resin pigment in [ all ] a pigment two to 10% of the weight, still higher printing gloss is acquired. This is considered because the effectiveness of suppressing osmosis of an ink vehicle more is in an under coat.

[0021] Although it is possible to permute a dry grinding calcium carbonate by the wet-grinding calcium carbonate or precipitated calcium carbonate in part, in order to obtain the outstanding printing gloss and the outstanding printing surface condition, the rate of a compounding ratio in all the pigments of a dry grinding calcium carbonate is required more than 10 mass %, and it is desirable that it is more than 40 mass % still more preferably.

[0022] Next, the raw material concretely used by this invention is described. About the pigment which constitutes the maximum surface, although the pigments used by this invention are a kaolin, a dry grinding calcium carbonate, and a hollow synthetic-resin pigment, they can also use together pigments, such as precipitated calcium carbonate, whiting, clay, a satin white, titanium oxide, an aluminum hydroxide, a zinc oxide, a barium sulfate, a calcium sulfate, a silica, activated clay, and a lake.

[0023] The pigment which constitutes under coats other than the maximum surface can make a wet-grinding calcium carbonate a subject, and pigments, such as a kaolin, a dry grinding calcium carbonate, precipitated calcium carbonate, clay, a satin white, titanium oxide, an aluminum hydroxide, a zinc oxide, a barium sulfate, a calcium sulfate, a silica, activated clay, and a lake, can be used together and used for it.

[0024] As a latex used by this invention, various copolymers, such as a styrene butadiene system, vinyl acetate acrylic, ethylene and a vinyl acetate system, a butadiene methyl methacrylic system, and a vinyl acetate butyl acrylate system, polyvinyl alcohol, a maleic-anhydride copolymer, isobutene and a maleic-anhydride copolymer, an acrylic acid, a methyl methacrylate system copolymer, etc. are mentioned.

[0025] In this invention, the coating liquid which uses a pigment as a principal component is the liquid water was made to dissolve or distribute with a pigment, a binder, and other additives, and, as for the blending ratio of coal of a pigment and a binder, it is desirable for a binder to be 10 - 17 mass section preferably more than 5 mass sections to the pigment 100 mass section generally.

[0026] As a binder used for this invention, adhesives generally known, such as natural system adhesives, such as oxidized starch, etherification starch, esterification starch, enzyme denaturation starch, and cold-water soluble starch obtained by carrying out flash plate dry cleaning of them, casein, soybean protein, are mentioned in addition to the latex mentioned previously. Moreover, the various assistants blended with the usual pigments for coated paper, such as a thickener, a water retention agent, a deck-watertight-luminaire-ized agent, a coloring agent, and lubricant, can use it suitably if needed.

[0027] Coating of the coating constituent of this invention obtained in this way is carried out to both sides of a base material by blade coating equipment, and 15g/m<sup>2</sup> is preferably suitable for the amount of coating two or more one side 6 g/m on dry weight criteria.

[0028] Moreover, when preparing an under coat, 9g/m<sup>2</sup> is preferably suitable for the amount of coating of an under coat two or more one side 3 g/m on dry weight criteria, and coaters, such as size press of a blade coating-machine method or a roll coater method, a gate roll, and a SIMM sizer, are used for the approach of carrying out coating of the under coat. Coating of the finishing is carried out to both sides of under coat paper by the blade method or Ayr knife method coating equipment, and 12 g/m<sup>2</sup> is preferably suitable for the amount of coating two or more one side 6 g/m on dry weight criteria.

[0029] As pulp, including NBKP, LBKP, NBSP, LBSP, GP and TMP, waste paper pulp, etc., they are used by internal assistants for paper making, such as various loading materials, such as whiting,

precipitated calcium carbonate, talc, a kaolin, and a titanium dioxide, a yield improver, a filtered water improver, a paper durability improver, and an internal sizing compound, if needed, choosing suitably, and a Fortlinear paper machine, a twin-wired paper machine, a combination paper machine, a cylinder machine, a Yankee machine, etc. can be used for the stencil paper used by this invention about the paper-making approach.

[0030]

[Example] Hereafter, although an example explains this invention concretely, this invention is not limited to these examples. In addition, especially, the section in an example and % show mass section and mass % altogether, as long as there is no assignment.

[0031]

ECF pulp LBKP which made the subject example 1 <stencil paper combination> chlorine dioxide bleaching (freshness 450mlcsf) 70 section NBKP (freshness 500mlcsf) The 30 sections [0032] <Internal chemical> precipitated calcium carbonate (it displays by \* Hara Kaminaka ash content) \*8 section marketing cation-ized starch 1.0 section marketing cation system polyacrylamide yield improver 0.03 section pulp and an internal chemical were adjusted by the above-mentioned combination, and the stencil paper of basis-weight 75 g/m<sup>2</sup> was milled.

[0033] To this stencil paper, the following coating combination was prepared at 55% of concentration, and carried out double-sided coating using the blade coating machine by part for 800m/in coating rate so that the amount of coating of a bone dry might serve as one side 15 g/m<sup>2</sup>.

[0034]

A <coating liquid combination> marketing dry grinding calcium carbonate 60.0 section marketing precipitated calcium carbonate The 2nd class kaolin of 20.0 section marketing A 15.0 section marketing hollow synthetic-resin pigment A 5.0 section marketing polyacrylic acid system dispersant 0.1 section marketing phosphorylation starch 5.0 section marketing SBR latex 10.0 section aqueous ammonia 0.1 section marketing calcium stearate The 0.5 sections [0035] To the obtained coated paper, calender processing was carried out using supercalender finishing equipment (number of stages: 12 steps, linear pressure:290 kg/cm) off-line, and lusterless coated paper was produced.

[0036] Lusterless coated paper was produced like the example 1 except having made the example 2 dry-grinding calcium carbonate into the 40 sections, and having made precipitated calcium carbonate into the 40 sections.

[0037] Lusterless coated paper was produced like the example 1 except having made the example 3 dry-grinding calcium carbonate into the 80 sections, and having made precipitated calcium carbonate into the zero section.

[0038] Lusterless coated paper was produced like the example 1 except having made the example 4 hollow synthetic-resin pigment into the two sections, and having made precipitated calcium carbonate into the 23 sections.

[0039] Lusterless coated paper was produced like the example 1 except having made the example 5 hollow synthetic-resin pigment into the ten sections, and having made precipitated calcium carbonate into the 15 sections.

[0040] Lusterless coated paper was produced like the example 1 except having made the example of comparison 1 dry-grinding calcium carbonate into the 35 sections, and having made precipitated calcium carbonate into the 55 sections.

[0041] Lusterless coated paper was produced like the example 1 except having made the example of comparison 2 hollow synthetic-resin pigment into the zero section, and having made precipitated calcium carbonate into the 25 sections.

[0042] Lusterless coated paper was produced like the example 1 except having made the 15 sections and the nature calcium carbonate of a gravity into the ten sections for the example of comparison 3 hollow synthetic-resin pigment.

[0043] Lusterless coated paper was produced like the example 1 except having carried out the equivalent permutation of the example of comparison 4 dry-grinding calcium carbonate at commercial whiting.

[0044] Lusterless coated paper was produced like the example 5 of a comparison except having carried

out the satin white equivalent permutation of the example of comparison 5 hollow synthetic-resin pigment.

[0045] In the stencil paper of example 6 example 1, the following under coat coating liquid so that the amount of coating of a bone dry may become with one side 9 g/m<sup>2</sup> After it prepares the following coating combination at 63% of concentration and it carries out double-sided coating using a blade coating machine by part for 800m/in coating rate, so that the amount of coating of a bone dry may serve as one side 11 g/m<sup>2</sup> The following finishing coating liquid was prepared at 55% of concentration, and lusterless coated paper was produced like the example 1 except having carried out double-sided coating using the blade coating machine by part for 800m/in coating rate.

[0046]

A <under coat coating liquid combination> own-making wet calcium carbonate A 100.0 section marketing polyacrylic acid system dispersant 0.1 section marketing phosphorylation starch 8.0 section marketing SBR latex 9.0 section aqueous ammonia 0.1 section marketing calcium stearate The 0.5 sections [0047]

A <finishing coating liquid combination> marketing dry grinding calcium carbonate 60.0 section marketing precipitated calcium carbonate The 2nd class kaolin of 20.0 section marketing A 15.0 section marketing hollow synthetic-resin pigment A 5.0 section marketing polyacrylic acid system dispersant 0.1 section marketing phosphorylation starch 5.0 section marketing SBR latex 10.0 section aqueous ammonia 0.1 section marketing calcium stearate The 0.5 sections [0048] Example 7 finishing coating liquid was prepared at 50% of concentration, and lusterless coated paper was produced like the example 2 except having carried out double-sided coating by the air knife coater by part for 800m/in coating rate so that the amount of coating of a bone dry might be set to 11g of one side/, and m<sup>2</sup>.

[0049] About the lusterless coated paper obtained by examples 1-7 and the examples 1-5 of a comparison, the following evaluation approach estimated and the result was shown in Table 1.

[0050] According to the <blank paper gloss> JIS P 8142, the blank paper glossiness of coated paper was measured using a Murakami style digital glossmeter (form GM-3D) (an incident angle, 75 angle of reflection).

[0051] Using the diamond by <printing surface condition> Mitsubishi Heavy Industries 4 color printing machine, 4 color pile printing halftone of Dainippon Ink GEOS-G was printed, and five steps of visual judgments estimated ink impression nonuniformity. 5 is the best, 3 is tolerance and 1 is very bad. Moreover, the monochrome solid printing of Dainippon Ink GEOS-G estimated coated layer surface reinforcement by five steps of visual judgments using RI circuit tester. 5 is the best, 3 is tolerance and 1 is very bad.

[0052] Using the diamond by <printing gloss> Mitsubishi Heavy Industries 4 color printing machine, Dainippon Ink GEOS-G carried out 4 color pile printing solid printing, and printing gloss was measured using a Murakami style digital glossmeter (form GM-3D) according to JIS P8142 (an incident angle, 60 angle of reflection).

[0053]

[Table 1]

例	白紙光沢 (%)	インキ着肉性	塗層表面強度	印刷光沢 (%)
実施例1	3 3	4	4	7 3
〃 2	3 7	5	4	7 4
〃 3	3 0	3	4	7 1
〃 4	2 9	4	4	7 0
〃 5	3 7	4	4	7 6
比較例1	4 1	5	3	7 5
〃 2	2 5	4	4	6 6
〃 3	5 0	5	3	7 4
〃 4	4 6	3	2	7 3
〃 5	2 7	3	1	6 8
実施例6	3 5	4	5	8 0
〃 7	3 4	4	5	7 7

[0054] From the result of the above-mentioned table 1, with the lusterless coated paper obtained in the examples 1-7, what is in the range of this invention about a dry grinding calcium carbonate and a hollow synthetic-resin pigment was used, and the good result was obtained about blank paper gloss, a printing surface condition, and printing gloss.

[0055]

[Effect of the Invention] Blank paper gloss is suppressed low and the lusterless coated paper of this invention can obtain lusterless coated paper excellent in a blank paper surface condition, a printing surface condition, and printing gloss.

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[Translation done.]

PAT-NO: JP02003286687A  
DOCUMENT-IDENTIFIER: JP 2003286687 A  
TITLE: MAT COATED PAPER  
PUBN-DATE: October 10, 2003

INVENTOR-INFORMATION:

NAME	COUNTRY
NAKAMURA, HISASHI	N/A

ASSIGNEE-INFORMATION:

NAME	COUNTRY
MITSUBISHI PAPER MILLS LTD	N/A

APPL-NO: JP2002090613

APPL-DATE: March 28, 2002

INT-CL (IPC): D21H019/42, D21H019/38, D21H019/40

ABSTRACT:

PROBLEM TO BE SOLVED: To provide mat coated paper suppressed in blank brightness and excellent in quality of a blank surface, quality of a printed surface and printed brightness.

SOLUTION: The mat coated paper is applied with a coating layer comprising a pigment and an adhesive as main ingredients on one surface or both surfaces of base paper made of pulp as a main raw material. The pigment comprises kaolin, dry milling calcium carbonate and a hollow synthetic resin pigment and contains 2-10 mass% hollow synthetic resin pigment based on the total pigments. The coating layer comprises an undercoat layer and a finish coat layer. The undercoat layer comprises wet heavy calcium carbonate and the adhesive and the

finish coat layer comprises the pigment and the adhesive as main ingredients.

The pigment comprises dry milling calcium carbonate and the hollow synthetic

resin pigment and contains 2-10 mass% hollow synthetic resin pigment based on the total pigments.

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DERWENT-ACC-NO: 1990-294040

DERWENT-WEEK: 199826

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TITLE: Heat-sensitive recording material - has upper  
coat layer contg. ball-shaped porous inorganic pigment of  
specified vol.

PATENT-ASSIGNEE: MITSUBISHI PAPER MILLS LTD [MITY]

PRIORITY-DATA: 1989JP-0028082 (February 6, 1989)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE
PAGES MAIN-IPC		
JP 02206586 A	August 16, 1990	N/A
006 N/A		
JP 2758423 B2	May 28, 1998	N/A
005 B41M 005/26		

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO
APPL-DATE		
JP 02206586A	N/A	1989JP-0028082
February 6, 1989		
JP 2758423B2	N/A	1989JP-0028082
February 6, 1989		
JP 2758423B2	Previous Publ.	JP 2206586
N/A		

INT-CL (IPC): B41M005/26

RELATED-ACC-NO: 1990-315951

ABSTRACTED-PUB-NO: JP 02206586A

BASIC-ABSTRACT:

Heat-sensitive recording has (A) upper coat layer contg. ball-shaped porous inorganic pigment of which total pore volume is at least 0.4 ml/g and average pore dia. of surface pore is at least 0.005 micron and (B) heat-sensitive

colouring layer.

(Claimed) Average particle size of the inorganic pigment is at most 3 microns and specific surface area is at least 400 m<sup>2</sup>/g. Inorganic pigment is hollow sphere material. (Not claimed) Content of inorganic pigment in the under coat layer is 3-80 wt.% (more pref. 5-50 wt.%). Binder used in the under coat layer is, e.g., styrene/butadiene latex, Pval, CMC, casein, gelatin, starch, etc.

USE/ADVANTAGE - The recording material is used for facsimile, label, etc.

preventing dust accumulation on thermal head and lowering of recording density in high density recording.

CHOSEN-DRAWING: Dwg.0/0

DERWENT-CLASS: A89 G05 P75

CPI-CODES: A12-W07F; G05-F;